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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,912	02/10/2004	Fanny Jeunhomme	14XZ133155	2002

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EXAMINER

WANG, CLAIRE X

ART UNIT	PAPER NUMBER
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2624

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/775,912	Applicant(s) JEUNEHOMME ET AL.	
	Examiner Claire Wang	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31, 38-43, 45-50, 52, 54, 55, 57, 58, 61, 62 and 65-70 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31, 38-43, 45-50, 52, 57, 58, 61, 62 and 65-70 is/are rejected.
- 7) ☒ Claim(s) 54-55 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of restriction requirements in the reply filed on May 17th, 2007 is acknowledged. The traversal is on the ground(s) that Species A-F are all relate and are directed towards similar subject matter. This is not found persuasive because Species A-F are mutually exclusive embodiments.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 32-37, 44, 51, 53, 56, 59-60 and 63-64 are considered non-elected claims. Thus, will not be examined in this office action.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of independent claims 1, 65 and 70 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Double Patenting

4. Claim 29 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 26. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

6. Claim(s) s 67 and 68 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 67 and 68 defines a computer program embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed a computer program can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody a "computer-readable medium" or equivalent storing a computer program in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-31, 38-43, 45-50, 52, 54-55, 57-58, 61-62, 65-70 are rejected under 35 U.S.C. 112 second paragraph.

- a. Claim 1 recites the limitations "the value of the variation" in line 6; "the current image" in line 7; "the first image" in line 8; "the current image" in lines 14-15; "the variation" in line 15; "the first image" in line 15. There are insufficient antecedent basis for these limitation in the claim. For the purposes of furthering prosecution, Examiner will read the above limitations of claim 1 as "a value of a variation", "a current image", "a first image" and "a variation."
- b. Claim 2 recites the limitations "the ratio" in line 3; "the current image" in lines 3-4. There are insufficient antecedent basis for these limitation in the claim. For the purposes of furthering prosecution, Examiner will read the above limitations of claim 2 as "a ratio."
- c. Claim 28 recites the limitations "the one hand" in line 2 and "the other hand" in line 3. There are insufficient antecedent basis for these limitation in the claim. For the purposes of furthering prosecution, Examiner will read claim 28 to be "...correction step depends on the gray level...and on the position of the zone..."

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- d. Claims 54-55 states the phrases "the one hand" and "the other hand" in lines 2 and 3 of said claim set. There are insufficient antecedent basis for these limitation in the claim. For the purposes of furthering prosecution, Examiner will read the claim set to be without the phrases "on the other hand" and "on the one hand."
- e. Claims 65 and 66 have the same issues as claims 1 and 2.
- f. Claim 70 has the same issues as claim 1.
- g. As to claims 3-31, 38-43, 45-50, 52, 54-55, 57-58, 61-62, 67-69, they are rejected because they are dependent from the rejected claims 1-2, 65-66 and 70.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-6, 10-31, 38-43, 45-50, 52, 57-58, 61-62, 65-66, and 69-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Heumann (US 6,201,850).

As to claim 1, Heumann teaches A method for calibrating an apparatus capable of acquiring a sequence of radiographic images and correcting images of an object under observation (enhanced thickness calibration and shading correction for automatic x-ray inspection; Title), comprising: for each image of a sequence acquired by the apparatus and for a given frequency (use of X-ray is well known to be within a certain frequency; Fig. 3E) of acquisition of the sequence (determination of solder joint thickness derived from X-ray images; Col. 3, lines 16-17), the apparatus is calibrated by determining the value of the variation of a mean of gray levels (a gray scale level of the solder, which is the object of interest is obtaining by subtracting a background gray level from the foreground gray level; (Col. 25, lines 49-55) since the foreground region is not composed of a single pixel but multiple pixels there must be some form of mean or averaging function in order to know the foreground gray level) in at least one zone of interest (350 Fig. 6) of the current image of at least one calibration device (calibrating an X-ray imaging system for determining the thickness of a first absorbing material in the

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presence of a second absorbing material; Col. 3, lines 56-60), the variation being determined relative to the mean gray level of the first image of the sequence (determining the thickness from X-ray images; Col. 3, lines 15-17) in each zone of interest; the determination of the variation is reiterated for a series of images sequences acquired using calibration devices resulting in first images of mean gray levels different from one sequence to another (Although Heumann does not specify that the image is a sequence of images, it is clear that Heumann does disclose that the technique used to identify the different thickness of the solder joints is done using multiple X-ray images (Col. 3, lines 16-17), therefore Heumann's technique may be applied to more than one image); and each image of an image sequence of the object under observation is corrected, comprising zones of observation having different gray levels by subtracting from the current image the variation of one gray level relative to the first image of the object, the subtraction being a function of the gray level considered from each zone of observation (Equation 4 teaches a way to find the difference in gray level; this is part of the linear shading correction technique; Col. 25, lines 59).

As to claim 70, it differs from claim 1 because a difference in the preamble. Since the preamble has no weight on the claim unless is brought into the body of the claim, claim 70 is thus read in the same way as claim 1. Please see above for detail analysis.

As to claim 2, Heumann teaches wherein a graphic representation is approximated having respective for its ordinate and abscissa (Fig. 7), the ratio having in the numerator the mean gray level variation of the current image of the sequence of the calibration device relative to the mean gray level of the first image and in the denominator the mean gray level of the first image; and the different gray levels of each first image; by a function for which the characteristics are known (see Equation 4).

As to claims 65-66, they are the apparatus claims of claims 1-2. Please see above for detail analysis.

As to claim 3, Heumann teaches wherein the function is a straight line (See Fig. 7).

As to claim 4. The method according to claim 1 wherein the gray level that is corrected in each zone of each image of the object under observation is the mean gray level (a gray scale level of the solder, which is the object of interest is obtaining by subtracting a background gray level from the foreground gray level; (Col. 25, lines 49-55) since the foreground region is not composed of a single pixel but multiple pixels there must be some form of mean or averaging function in order to know the foreground gray level).

As to claims 5-6, they are the same as claim 4. Please see above for detail analysis.

As to claim 10, Heumann teaches wherein the gray level of at least one pixel chose in each image of the object under observation is corrected (Equation 4 teaches a way to find the difference in gray level; this is part of the linear shading correction technique; Col. 25, lines 59).

As to claims 11-12, they are the same as claim 10. Please see above for detail analysis.

As to claim 13, Heumann teaches wherein the calibration is done before the acquisition of the image sequence of the object under observation (it is possible to use two stored system parameters to calibrate the system, thus the calibration is done before the extrapolation of the image; Col. 3, lines 43-47).

As to claims 14-18, they are the same as claim 13. Please see above for detail analysis.

As to claim 19, Heumann teaches wherein each mean gray level value of the series of sequences of the calibration is given by the observation of at least one calibration plate of a defined thickness comprising each calibration device, its thickness

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changing from one series to another (calibrating an X-ray imaging system for quantitatively determining the thickness of a first absorbing material the a second absorbing material with a first known thickness in combination with three thickness of the second absorbing material; Col. 3, lines 56-67).

As to claims 20-25, they are the same as claim 19. Please see detail for analysis.

As to claim 26, Heumann teaches wherein the mean gray level is determined using a plurality of zones of interest simultaneously at the time of calibration (a gray scale level of the solder, which is the object of interest is obtaining by subtracting a background gray level from the foreground gray level; (Col. 25, lines 49-55) since the foreground region is not composed of a single pixel but multiple pixels there must be some form of mean or averaging function in order to know the foreground gray level).

As to claims 27 and 29, they are the same as claim 26. Please above for detail analysis.

As to claim 28, Heumann teaches wherein the subtraction of the correction step depends on the gray level in each zone of observation (a gray scale level which is representative of the solder; Col. 25, lines 49-51) and on the position of the zone of observation relative to each zone of interest (background gray region; Col. 25, line 52).

As to claims 30-31, they are the same as claim 28. Please see above for detail analysis.

As to claim 38, Heumann teaches wherein each calibration device is placed in a field of acquisition of the apparatus also comprising the object under observation (Fig. 4A).

As to claims 39-43, they are the same as claim 38. Please see above for detail analysis.

As to claim 45, Heumann teaches wherein each calibration device comprises at least two zones of interest having a mean gray level different from one zone to another for each image (first absorbing material and a second absorbing material; Col. 3, lines 58-59).

As to claims 46-50, they are the same as claim 45. Please see above for detail analysis.

As to claim 57, Heumann teaches wherein the calibration measurements of at least two acquisitions of successive sequences are combined (gray scale of solder and the gray scale of a background level; Col. 25, lines 50-55).

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As to claims 58 and 61-64, they are the same as claim 56. Please see above for detail analysis.

As to claim 69, Heumann teaches a computer apparatus or means for processing for carrying out all the steps of claim 1 (computer; 270 Fig. 4C).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heumann.

As to claim 7, Heumann teaches (a gray scale level of the solder, which is the object of interest is obtaining by subtracting a background gray level from the foreground gray level; (Col. 25, lines 49-55) since the foreground region is not composed of a single pixel but multiple pixels there must be some form of mean or averaging function in order to know the foreground gray level). Heumann does not expressly disclose that the median gray level is used instead of the mean gray level. However, Examiner takes Official Notice that using mean and medium is well known in the art. It would have been obvious at the time of the invention was made to one of ordinary skill in the art to use the medium gray level instead of the mean since Examiner takes official notice that mean and medium is well known.

As to claims 8-9, they are the same as claim 7. Please see above for detail analysis.

Allowable Subject Matter

13. Claims 54-55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Farrokhnia et al. (US 6,694,047) teaches a method and apparatus for automated image quality evaluation of X-ray systems using any of multiple phantoms.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire Wang whose telephone number is 571-270-1051. The examiner can normally be reached on Mid-day flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Claire Wang
08/16/2007



SAMIR AHMED
PRIMARY EXAMINER